AUTHOR INDEX TO VOLUME 46

A

Abanades, J. C. . . . 1888
Abel, O. . . . 803
Acharya, M. . . . 911
Achilleos, E. C. . . . 2128
Adánez, J. . . . 1888
Adjiman, C. S. . . . 1769
Adschiri, T. . . . 843
Aghalayam, P. . . . 2017
Agnihotri, R. . . . 1157
Agrawal, R. . . . 2198, 2211
Aguado, R. . . . 1025
Ajbar, A. . . . 321
Al-Arfaj, M. A. . . . 2417
Al-Dahhan, M. H. . . . 597
Al-Musa, A. . . . 1449
Albert, M. . . . 1676
Alexander, P. . . . 2151
Alhumazi, K. . . . 321
Alonso, A. A. . . . 1593
Alopaeus, V. . . . 2369
Altobelli, S. A. . . . 2344
Amirthalingam, R. . . . 1974
Anderson, W. A. . . . 1461
Andersson, S. R. . . . 1106
Andrae, J. C. G. . . . 1454
Androulakis, I. P. . . . 361, 1769
Antalek, B. . . . 6
Aoki, K. . . . 221
Aoufi, A. . . . 632
Arai, K. . . . 843
Arena, F. . . . 2285
Asaeda, M. . . . 565

B

Badgwell, T. A. . . . 1007
Baier, G. . . . 2395
Balakotaiah, V. . . . 1300
Baléo, J.-N. . . . 675
Baltus, R. E. . . . 1149, 1307
Bandopadhayay, P. C. . . . 647
Banga, J. R. . . . 1593
Bansal, V. . . . 335
Barolo, M. . . . 146
Barona, A. . . . 1025
Başağaoğlu, H. . . . 2097
Bates, F. S. . . . 229
Bearden, M. . . . 1492
Bek-Pedersen, E. . . . 1271
Bekiaris, N. . . . 955
Beran, Z. . . . 509
Berger, R. J. . . . 1837
Berman, Y. . . . 769
Berry D. A. . . . 2435
Bhaskar, V. . . . 1046
Biesheuvel, P. M. . . . 499, 626
Bilbao, J. . . . 1025
Björnbom, P. H. . . . 1454
Bliek, A. . . . 2295
Blowers, P. . . . 2041
Bouzerar, R. . . . 257
Bramley, A. S. . . . 2151
Bridgwater, J. . . . 1723
Brosilow, C. . . . 1566, 1616
Brunazzi, E. . . . 1131
Buffham, B. A. . . . 1449

C

Campbell, C. B. . . . 1471
Cao, C. . . . 515, 523
Cardoso, S. S. S. . . . 1947
Carrier, J. . . . 427
Carvalho, M. S. . . . 1907
Cavoy, E. . . . 247
Chadda, N. . . . 923
Chang, D.-M. . . . 1581
Chang, M. . . . 434
Changrani, R. G. . . . 829
Channell, G. M. . . . 72
Chase, G. G. . . . 1918
Chatterjee, A. . . . 462
Chauk, S. S. . . . 1157
Chen, D. . . . 1034
Chen, L.-H. . . . 160
Chen, S. H. . . . 2352
Chiang, A. S. T. . . . 616
Chien, I.-L. . . . 1581
Chinju, H. . . . 937
Chisti, Y. . . . 1872
Chiu, M.-S. . . . 309
Chiu, T. Y. . . . 266
Cho, S.-H. . . . 790
Choi, C. K. . . . 15
Christiansen, R. L. . . . 1441
Christodoulou, K. N. . . . 2128
Christofides, P. D. . . . 266
Chu, C.-Y. . . . 2383
Churchill, S. W. . . . 1704
Clark, S. A. . . . 6
Clements, D. J. . . . 946
Conner, W. C. . . . 758
Contreras Gómez, A. . . . 1872
Coppens, M.-O. . . . 2183
Coto García, B. . . . 1676
Crescitelli, S. . . . 824
Cui, S. . . . 309
Cumming, I. W. . . . 1449
Cushman, J. H. . . . 2344

D

Dao, E. K. . . . 1300
Darrat, I. . . . 1850
Datta, R. . . . 380
Davies, G. M. . . . 1753
Davis, H. T. . . . 1662
de Croon, M. H. J. M. . . . 1837
de Diego, L. F. . . . 1888
de Frias, A. . . . 2237
de Smet, C. R. H. . . . 1837
de Souza, R. F. . . . 1234
Delgado, J. M. P. Q. . . . 1089
Deo, M. D. . . . 1120
Derksen, J. J. . . . 1317
Dewsbury, K. H. . . . 46
Di Pastena, V. . . . 2175
Dimian, A. C. . . . 133
DiNaro, J. L. . . . 2274
Ding, L. . . . 257
Dirckx, C. J. . . . 6
Diwekar, U. M. . . . 2475
Doherty, M. F. . . . 923, 1348
Domenico, R. D. . . . 1478
Dong, J. . . . 1957
Doyle, III, F. J. . . . 2537
Dudukovic, M. P. . . . 434
Dumont, E. . . . 1138

E

Economou, I. G. . . . 997
Edgar, T. F. . . . 281
Elmasides, C. . . . 1260
Engstrom, J. R. . . . 2
Ennis, B. J. . . . 529
Escobedo, F. A. . . . 2086

F

Fair, J. R. . . . 79
Fairuzov, Y. V. . . . 1332
Falconer, J. L. . . . 779, 1201
Fan, L. S. . . . 1157, 2162
Fayolle, F. . . . 1138
Feng, X. . . . 724
Ferreira, M. J. F . . . 707

Firoozabadi, A. 197, 416, 883, 892
Fissan, H. 1735
Fletcher, N. H. 666
Flood, A. E. 239
Floudas, C. A. 1422, 1769
Fogler, H. S. 1059
Fokma, Y. S. 2295
Foley, H. C. 651, 911
Fonade, C. 476
Ford, D. M. 99
Fraser, D. M. 2112
Freed, L. E. 1860
Frusteri, F. 2285
Fuchs, L. 2373
Fürst, W. 2318

G

Gani, R. 1271
Garcia, A. 2237
García-Camacho, F. 1872
García-Labiano, F. 1888
Garg, R. 2030
Gates, C. M. 2076
Gee, K. R. 2128
Georgakis, C. 292
Gerlings, J. H. 1241
Gertler, J. 1897
Ghadge, R. S. 1280
Ghorayeb, K. 883, 892
Gidaspow, D. 52
Ginn, T. R. 2097
Gladden, L. F. 2151
Gogate, P. R. 372, 1641
González-Cuenca, M. 626
Goosen, M. F. A. 1927
Graham, M. D. 2395
Grandmaison, E. W. 1927
Greenkorn, R. A. 2344
Groenendijk, A. J. 133
Grossman, Ignacio E. 1700
Guedes de Carvalho, J. R. F ... 707, 1089
Gupta, S. K. 1046
Güttinger, T. E. 955

H

Hall, L. D. 6
Hallale, N. 2112
Harding, S. T. 1422
Harold, M. P. 2123
Hartman, M. 509
Hatzimanikatis, V. 2340
Hauan, S. 1218, 2225
Hawkins, R. B. 1007
Hayashi, T. 1688
He, W. 2053
Heath, J. A. 1998
Helenius, J. 1541
Hellgardt, K. 1449
Helminen, J. 1541
Henda, R. 1275
Hewitt, J. M. 6
Hillmyer, M. A. 1900
Hirakoso, H. 843
Hlavacek, V. 355, 2499
Hofmann, H. 1241
Howard, J. B. 2274
Hritzko, B. J. 552
Hsu, J. T. 1191
Hu, X. 1743
Hua, X. 980
Hufton, J. R. 659
Humayun, R. 2065
Hussain, Q. E. 1937
Hutson, N. D. 2305
Hwang, G.-J. 92
Hwang, I. G. 15
Hyun, J. C. 2106

I

Iddir, H. 610
Iedema, P. D. 133
Iliuta, I. 597
Ioannides, T. 1260
Irwin, N. C. 2344
Ishibashi, H. 1688
Ishikawa, I. 1688
Ito, Y. 1191
Iveson, S. M. 529
Ivory, J. 724
Izumi, S. 565

J

Jadhav, R. A. 1157
Jaeckle, C. M. 1989
Jaffrin, M. Y. 257
Jahangiri, M. 2245
Janse, A. M. C. 499
Jauregi, P. 24
Jensen, K. L. 380
Jiang, J. 2525
Johns, M. L. 2151
Johns, M. R. 239
Johnston, K. P. 857
Johnston, L. P. M. 946
Jongen, T. 2140
José, R. A. 575
Joshi, J. B. 1280, 1798
Ju, S. P. 110
Jung, H. W. 2106
Jutan, A. 980

K

Kang, K. H. 15
Kano, J. 1694
Kapteijn, F. 1096
Karamanev, D. G. 46
Kassmann, D. E. 1007
Kaul, B. K. 540
Kawaoka, K. 6
Kay, H. 2426
Kelkar, V. V. 389
Kessler, F. D. 695
Kevrekidis, I. G. 2128
Kheshgi, H. S. 1907
Khinast, J. G. 2030
Kim, J. 1521
Kim, J.-G. 1120
Kim, J.-N. 790
Kim, K.-J. 2475
Kimura, S. 1967
Knutson, B. L. 1850
Ko, B.-S. 281
Kobayashi, M. 1688
Kodde, A. J. 2295
Kokossis, A. C. 2256
Kookos, I. K. 1998
Kothare, M. V. 2456
Kovács, T. 2373
Krammer, G. F. 1253
Kruis, F. E. 1735
Kuhnert, C. 1676
Kumar, S. 119
Kusakabe, K. 221
Kwon, J. H. 110

L

Lafforgue, C. 476
Laiseca, M. 1616
Lamari, M. 632
Langer, R. 1286
Larachi, F. 597
Lau, R. 2162
Laurence, R. L. 758
Laurent, B. F. C. 1723
Lavecchia, R. 1478
Le Cloirec, P. 675
Lee, D. J. 110
Lee, J. H. 1974
Lee, J. W. 1218, 2225
Lee, Y.-L. 160
Legrand, J. 1138
Lehoucq, S. 247
Leitenberger, B. J. 2518
Leitman, M. 1616
Lemaître, J. 1241
Lewin, D. R. 1825
Li, F. 1034
Li, Q. 1927
Liao, H.-T. 1168
Lightfoot, E. N. 2395
Lin, Y. S. 1521, 1957
Liné, A. 476
Lirer, L. 2175
Lísal, M. 866

Litster, J. D. 529
Liu, H. 670
Liu, L. X. 529
Liu, P. K. T. 2245
Liu, W. 1957
Liu, Y. 540
Lohmiller, W. 588
Luo, X. 2162
Luss, D. 2030
Luu, P. 1650
Luus, R. 427
Luyben, W. L. 2417
Lytle, C. D. 1894
Lyu, S.-P. 229

M

Macedonia, M. D. 2504
MacGregor, J. F. 1813, 1897, 1989
Macías-Machín, A. 1340
Macías-Salinas, R. 79
Macosko, C. W. 229
Maffettone, P. L. 824
Maginn, E. J. 2504
Mahgerefteh, H. 997
Maisels, A. 1735
Malbrunot, P. 632
Maldonado, C. 2237
Mallada, R. 2489
Malone, M. F. 923
Mancusi, E. 824
Manousiouthakis, V. 2408
Maranges, C. 476
Margaritis, A. 46
Marin, G. B. 1837
Mariño, M. A. 2097
Maroudas, D. 878
Marquardt, W. 803
Marzocchella, A. 901, 2175
Masel, R. 2041
Maskan, F. 946
Mason, G. 1449
Matsuyama, K. 857
Maurer, G. 1676
Maynes, D. 450
Mazzotti, M. 1384, 1530
McCormick, A. V. 1662
McCoy, B. J. 751, 2097
Mehta, V. L. 2256
Meldon, J. H. 1860
Menéndez, M. 2489
Mercier-Bonin, M. 476
Merola, G. 824
Mhatre, S. 1566
Migliorini, C. 1384, 1530
Miller, K. T. 72
Mio, H. 1694
Mishima, K. 857
Misra, M. 119
Misro, S. K. 1157
Mitchell, G. R. 24
Mohanty, S. 1662
Moholkar, V. S. 684
Molina Grima, E. 1872
Moo-Young, M. 1461
Morari, M. 955, 2456
Morbidelli, M. 1384, 1530
Mori, Y. H. 937
Morooka, S. 221, 1688
Moulijn, J. A. 1096
Mukasyan, A. S. 2518
Myers, M. R. 1894

N

Nagarajan, N. 1059
Nekhamkina, O. 1632
Neri, A. 52
Newman, J. 2076
Nezbeda, I. 866
Ng, K. M. 389, 1400, 2435
Nguyen, T. V. 2053
Ni, X. 37
Noble, R. D. 779, 1201

O

Obradovic, B. 1860
Ogunnaike, B. A. 2123
Olazar, M. 1025
Onozaki, M. 1688
Onuki, K. 92
Ottavi, A. 1478

P

Paatero, E. 1541
Paglianti, A. 1131
Pan, C. Y. 724
Pan, H. 416
Pan, Y. 434
Pandit, A. B. 372, 684, 1641
Papadopoulos, K. D. 1471
Pape, E. A. 779
Papini, C. A. 146
Park, J.-H. 790
Park, Y. K. 2017
Parker, A. 1290
Parker, D. J. 1723
Parker, R. S. 2537
Parmaliana, A. 2285
Patil, N. S. 1280
Paullier, P. 257
Pedeferri, M. P. 1530
Pedenera, M. 2489
Peppas, N. A. 2537
Pereira, N. E. 37
Perkins, J. D. 335, 1998
Peschla, R. 1676
Pfund, D. 1496
Phimister, J. R. 1508
Pintauro, P. N. 1177
Pistikopoulos, E. N. 335
Popescu, A. 1496
Poshusta, J. C. 779
Pratsinis, S. E. 407
Prausnitz, J. M. 197, 2525
Prins, W. 499
Prud'homme, R. K. 2128
Pullum, L. 489, 647

Q

Qiao, S. 1743
Qin, S. J. 119

R

Raal, J. D. 210
Rallabandi, P. S. 99
Rasmuson, A. 1106
Raupp, G. B. 829
Ray, A. K. 1034, 1046
Rector, D. 1496
Reed, W. F. 1290
Rege, S. U. 734, 1421
Reklaitis, G. V. R. 2122
Revstedt, J. 2373
Rice, R. G. 670
Rinard, I. 2456
Ritter, J. A. 540
Romagnoli, J. A. 1607
Rotem, Y. 1825
Routson, L. B. 1894
Rubinstein, B. Y. 1632

S

Sable, S. P. 684
Sadus, R. J. 169
Saegusa, H. 1688
Safavi, A. A. 1607
Saha, P. 997
Sahimi, M. 2245
Saito, F. 1694
Sajc, L. 1368
Sakai, N. 1688
Salatino, P. 901, 2175
Samant, K. D. 2435
Sanchez, I. 1593
Sánchez Mirón, A. 1872
Sandler, S. I. 2120
Santamaria, J. 2489
Santana, D. 1340
Sarkari, M. 1850
Sawant, S. B. 1280
Schieber, J. D. 610
Schlosberg, R. H. 672
Schmidt, L. D. 1492
Schouten, J. C. 1837, 2183

Seaton, N. A. 1753
Seborg, D. E. 1556
Sederman, A. J. 2151
Sedigh, M. G. 2245
Seemann, D. 119
Seider, W. D. 1508
Seinfeld, J. H. 226
Semiat, R. 1376
Shao, J. 1149, 1307
Sharif, M. A. R. 1937
Sheintuch, M. 1632
Shekarriz, A. 1496
Shepherd, I. C. 647
Shi, J. 1075
Shiau, C.-Y. 1168
Shimizu, S. 92
Shinnar, R. 2456
Shukla, K. 892
Siddall, J. 1492
Simon, L. C. 1234
Singh, P. 1059
Singhal, A. 1556
Sircar, S. 659
Skogestad, S. 1209
Slotine, J.-J. E. 588
Smith, W. R. 866
Soares, J. B. P. 1234
Song, H.-S. 2106
Sookkumnerd, T. 1191
Sridhar, L. N. 2237
Stephan, E. A. 1918
Stephanopoulos, G. 427
Sterling, W. J. 751
Stokes, C. L. 430
Strano, M. S. 651
Strieder, W. 2330
Stryczek, K. 1616
Sundaresan, S. 1102
Sung, S. W. 1974
Swallow, K. C. 2274
Syed, F. H. 380
Szukiewicz, M. K. 661

T

Tachikawa, N. 1688
Tamir, A. 769
Tanabe, D. 857
Taniguchi, M. 1967
Taylor, D. 1927
Tester, J. W. 2274
Thakre, S. S. 1798
Thiers, L. 2518
Tiller, F. M. 110
Tirrell, M. V. 2121
Tomasko, D. L. 2065
Tooma, J. 6
Trägårdh, C. 2373
Trnka, O. 509
Tsai, S. C. 1650
Tsantilis, S. 407
Tsay, C. S. 616
Tsotsas, E. 1084
Tsotsis, T. T. 2245
Tsukagoshi, M. 843
Tsuru, T. 565
Tuan, V. A. 779, 1201
Turian, R. M. 695
Turner, M. D. 758
Turunen, I. 1541

U

Uchiyama, K. 937
Ungar, L. H. 575, 2426

V

Vacassy, R. 1241
Valappil, J. 292
van de Graaf, J. M. 1096
van den Bleek, C. M. 2183
van Ommen, J. R. 2183
van Swaaij, W. P. M. 499
Van den Akker, H. E. A. 1317
Varley, J. 24
Varma, A. 2518
Venerus, D. C. 610
Venkatesan, R. 1059
Verhève, D. 247
Verweij, H. 626
Verykios, X. E. 1260
Veselý, V. 509
Vigouroux, F. 1290
Vlachos, D. G. 2017
Vunjak-Novakovic, G. 1368, 1860

W

Wachs, A. 1825
Walker, D. D. 552
Wang, C.-Y. 2383
Wang, D. 1607
Wang, D.-M. 2383
Wang, N.-H. L. 552
Wang, Q.-G. 309
Ward, J. H. 2537
Watanabe, M. 843
Wei, Y. S. 169
Weinberg, W. H. 2
Weinstein, H. 515, 523
Welham, N. J. 68, 666
Welty, J. 1496
Westerberg, A. W. 1218, 1700, 2225
White, E. T. 239
Wibowo, C. 1400
Wiley, D. E. 946
Wilson, S. 2408
Winn, D. 1348
Winterberg, M. 1084
Wittgens, B. 1209
Wouver, A. V. 247
Wu, J. 197, 489, 647
Wu, L.-Q. 1075
Wu, R. C. 1471

X

Xu, N. 1075

Y

Yamauchi, S. 857
Yang, F. 355, 2499
Yang, G. Q. 2162
Yang, R. T. 734, 1421, 2305
Yang, Y. 1177
Yeh, H.-M. 2383
Yi, J. S. 2053
Ying, J. Y. 1902
Yngvesson, K. S. 758
Yoon, S. 1813, 1897
Yoshioka, T. 565
Young, T. J. 857
Yu, C.-C. 1581

Z

Zarrebini, M. 1947
Zelmanov, G. 1376
Zenoni, G. 1530
Zhang, D. 2318
Zhang, Z. 670, 1461
Zhu, Y. 647
Zukoski, C.F. 72
Zuo, J. Y. 2318

SUBJECT INDEX TO VOLUME 46

A

acoustic cavitation 372
acoustic emission 684
activated carbon . . 1168, 1541, 1753, 2065
activation energy 565, 1096
activity calculation 2076
activity coefficients 210
adaptive 1607
adsorption kinetics 160, 1743
adsorption 632, 758, 1168, 1541, 1753, 1894, 2065, 2369
adsorption separation 1384
advection-dispersion 1168
aerosol growth modeling 407
aerosol 226, 407, 2352
agglomeration 2183
aggregated beads 1927
aggregation 416
agitation 647, 1723
air purification 829
air separation 99, 2305
airlift bioreactor 1368
airlift photobioreactors 1872
alumina 1541
Amberlyst-15 380
ammonia 1541
ammonia reactor 824
amplitude spectrum 509
anisotropic thermal conductivity 610
annular flow 1300
aperiodic heterogeneous model 2344
approximate model 661
aromatic 2274
asphaltene 197, 416
association 197
atomization 1650
A-type zeolite 221
axial dispersion 79, 1688
axial flow 489
axial mixing 79
azeotrope 2225
azeotropic distillation 955

B

backmixing 523
ball mill 1694
ball-filling ratio 1694
batch distillation 2475
benzene 2274
benzoic acid 1034
bifurcation 824, 2030
bimodal approximation 1290
binary reactive distillation 2225
bioengineering 2330
bioinformatics 2340
biomaterials 1286
bioreactor 321
blade 489, 1723
block copolymer 229
boron substitution 1201
boundary effects 2352
boundary layer 1454, 2395
branch and bound 361, 1769
bubble column 434, 670, 1688, 1872
bubble diameter 24
bubble dynamics 684
bubble formation 2162
bubbles 1340
buoyancy driven flow 670
butane isomers 1201

C

calcium carbonate 1241
capillary flow 695
carbochlorination 355
carbon 911
carbon dioxide 901, 937
carbon molecular sieve membranes . . 2245
carbon molecular sieves 651
carousel design 552
cartilage 1860
cartridge filtration 6
cascade control 281, 980
catalysis 2504
catalysts 1902
catalytic partial oxidation 1260, 6572
catalytic pyrolysis 1025
cathode 2053
cavitation 684
centrifugal extractor 2395
ceramic 616
cesium removal 552
CFBC 1888
CFD 1317, 1798, 2373
chain walking 1234
chemical equilibrium 866
chemical vapor deposition 92
chemoreceptors 2330
chiral chromatography 1530
chiral drugs 247
chiral separations 1530
climate 226
clouds 226
CO_2 separation 937
coal liquefaction reactor 1688
coalescence 229, 529
coating 626
colloidal gas aphrons (CGA) 24
colloidal processing 626
combinatorial chemistry 2
combustion modeling 361
combustion synthesis 2518
commodity chemicals 6572
competition 321
complex system 2456
composite mesh 1131
composition control 146, 1974
compressibility 110, 372, 1641
compression 119, 1275
compressive yield stress 72
computational biology 2340
computational fluid dynamics . . 675, 2140
concentration field 2128
concentration polarization 1967
conductivity probe 476
conical spouted bed reactor 1025
consecutive reactions 2295
continuous mixtures 751
continuous chromatography 1384
contraction theory 588
control 427, 428, 1700, 2198, 2456
control configuration 1508
control structure selection 1998
controllability analysis 133
controlled release 2383
controller design 588, 2537
correlation for collapse pressure 1641
correlation for pressure generated 372
cosolvency 857
countercurrent flow reactor 2030
criterion for draw resonance 2106
critical point 2525
crystal growth 239, 450
crystal shape 1348
crystalline silicotitanate 552
crystallization 239, 1376, 1400
crystallizer 266, 1376
crystallizer control 2456
CVD 1521
cyclohexane 758
cyclone separator 1317

D

data analysis 1989
data rectification 1556
data-based control 1974
deactivation 1280
decentralized control 1998
deep bed filtration 1918

deformation visualization 2128
desalination. 1967
design 1271, 1641, 2256
desorption. 15
detergents 1471
deterministic global optimization . . . 1769
dextran 1149
diabetes 2537
differential ebulliometry 210
diffusion 99, 2330, 2383
diffusion with reaction 661
diffusivity 565, 651, 1096
dispersants 1471
dispersion 37, 1089
dissolution 666
dissolution kinetics 1290
distillation 146, 1271, 1508, 2198
distillation control. 146
distillation, batch 1209
distillation, multicomponent 1209
distributed process systems 1593
distributed parameter systems 980
disturbance and failure detection. . . . 1825
dominance 2456
Donnan dialysis separation 1177
double-effect distillation 2211
downflow 515, 523
draft tube 1376
drag coefficient. 46
drainage 24
draw resonance. 2106
drift flux 2175
droplets. 1650
drug delivery 1286
dual-composition control 1508
dynamic filtration 257
dynamic optimization 803
dynamic storage 632
dynamic surface tension 160
dynamics 133, 2030

E

effective surface 1918
efficient book-keeping 119
electrodiffusion diagnostic 1138
electrokinetics. 1177
electrolyte. 2318
electrophoretic deposition. 626
emissions 1888
enantiomer adsorption equilibria. . . . 1530
energy efficient. 1209
enrichment 540
equation of state. . . 169, 2065, 2318, 2525
equilibrium theory 1384
ETBE. 380
ethane. 1753
ethanol 857
etherification. 380
ethyl tert-butyl ether 380
ethylene 6572
experiment design. 247
experimental validation. 675
extended Kalman filter 292
extraction 160

F

falling film 1300
fault detection and isolation 1813
feasibility 923, 2475
feed plate 1271
filter tuning. 292
filtering. 1556
filtration 6, 72, 110
finite element subsurface
flow model 1120
finite reflux. 2225
fixed-bed reactors 980
flame and hot-wall reactors. 407
flexibility 335
flooding 707
flow characterization. 2140
flow maldistribution 1084
flow visualization 2151
fluid mechanics 476, 499, 901,
1927, 2183
fluidization 355, 515, 2175
fluidized bed . . . 499, 509, 523, 901, 1340
fluidized catalytic cracker control . . . 2456
fluids 169
fluorinated antisolvents. 1850
foams 24
forced Rayleigh scattering 610
formaldehyde 1676, 2285
fractionation 751
fractured porous media 1120
friction factor 1496
fructose. 239
functional genomics 2340

G

gas absorption. 937
gas mixing 523
gas permeation 779
gas separation. 92, 221, 724,
779, 911, 1957
gas-liquid interface 1280
gas-liquid reactions. 389
gas-metal reactions 2518
gas-solids fluidized bed. 2183
gel chromatography 1927
gel swelling 2128
gelation. 1059
genetic algorithm 1046
Gibbs adsorption layer 15
global optimization 1422, 2017
glycol 1149
glycosaminoglycan 1860
gradient formation. 1191
grand canonical Monte Carlo
simulation. 1753
granular dynamics. 1723
granular flow 499
granular material. 1723
granulation 529
graphical method 1271
gravity current 1947
greenhouse gases 226
grinding 666, 1694
growth rate dispersion. 239

H

H_2 PSA. 790
heat conduction 610
heat transfer 1798
helical flow. 1937
helium 1449
heterogeneities 72
high pressure. 632, 2162, 901
high velocity fluidized bed 515
high-dimensional systems 2435
high pressure and temperature. 1157
hindered diffusion 1149, 1307
Horváth-Kawazoe equation 734, 1421
hybrid systems 803
hydrocarbons 1957
hydrocracking. 2504
hydrodynamic cavitation. 1641
hydrodynamic interaction 229
hydrodynamic regimes 901
hydrodynamics 476, 499, 2183
hydrogen 632, 1957, 2017
hydrogen flames 1454
hydrogen permeation 1075
hydrogen permselectivity 92
hydrolysis. 2274
hysteresis 1662
HZSM-5 zeolite 1025

I

IAST 1743
IDEAS 2408
IMC 1566, 1616
immiscible liquids. 1332
immobilized plant cells 1368
impact energy 1694
impeller 489, 647
impinging streams 769
imposed symmetry 2030
inferential control 1974
infinitely dilute 210
information theory 1478
infusion pumps 2537
inhibitor transport 1332
inorganic materials 616, 626
inorganic membranes. 92, 779, 911
insulin. 2537
integer optimization 361

interdigitated gas distributor 2053
interaction potentials in nanopores 734, 1421
interfacial area 597
interfacial tension 1850
internal model control 309
intraparticle convection 1927
inventory control 1593
inverse method 1253
inverted column 2475
ion-exchange membranes 1177
ion-exchange resin 380
ionic reference state 2318
isothermal spinning 2106

K

Kalman filter 1581, 1974
kinematic waves 2106
kinetic model 843, 1260, 1837, 2285
kinetic theory 52
kinetically controlled 923
kinetics 2274, 2330
kneaders 2140
knitted mesh mist eliminator 1131

L

large-eddy simulation 1317
laser doppler anemometry 1106
latent variable models 1989
lateral dispersion 1089
lateral mixing 1089
lattice model 1662
layered beds 790
leaching 666
LES 2373
ligand binding 2330
light 1461
lime 1157
linear driving force 661, 2097
linear programming 1007
linear stability theory 15
lipolase 1280
liquid extraction 2395
liquid flow pattern 434
liquid holdup 597
liquid turbulence 434
liquid velocity distribution 670
liquid-liquid equilibria 169, 2318
liquid-liquid extraction 769, 1368
liquid-solid suspension 2162
local bubble-size distribution 1340
longitudinal mixing 79
low flow limit 1907
low-temperature chlorination 2499
low-silica X 2305
LQG 1581
LTI uncertainty 309
LTV uncertainty 309
lump formation 1290

M

μ synthesis 1616
macromolecular transport 1149, 1307
magnetic resonance imaging 6, 2344
Marangoni convection 15
marine lubricants 1471
mass exchange networks 2112, 2408
mass transfer 1034, 1177, 1860, 1927, 2097, 2237, 2395
mass-transfer coefficient 160
mass-transfer zone 552
mass-transfer equipment 937
material line tagging 2128
materials discovery 2
materials synthesis 1902
mathematical model . . . 1368, 1860, 2053
mathematical programming 1998
matrix fractions 1566
MBPCA 1825
McCabe-Thiele diagram 1218
mean residence time 675
mechanical activation 68
mechanism reduction 361
melt spinning 2106
membrane parameter 565
membrane reactors 2489
membrane stability 779
membrane transport 2383
membranes . . . 616, 724, 779, 1096, 1149, 1191, 1201, 1307, 1521, 1967, 2245
methane partial oxidation 1837, 2285
methane 1260, 1753
methanol 758, 1676
method of characteristics 997
method of weighted residuals 266
MFI zeolite membrane 1957
MFI 616
micellization 416
microbial cultures 321
microchannel 1496
microencapsulation 857
microfiltration 257
microfluidics 1496
micromixing 1241
micropore size distribution 1743
microporous media 651
microreactors 1735
microstructure 72, 2518
microwave heating 1593
microwaves 758
middle vessel column 1508, 2475
milling 666
millisecond reactors 6572
minimum variance control 281
mist flow 1131
mixed gases 1743
mixed-integer programming 1769
mixed solvents 2318
mixing 489, 647, 2140, 2373
mixing index 2175
mixing length 37
mixing/segregation 2175
mixtures 751
model predictive control 1007, 1974
model state feedback 1566
model uncertainty 266, 292, 2537
model validation 52
modelability 2456
modeling . . . 476, 597, 632, 666, 670, 892, 1084, 1461, 1700, 1798, 2426
modified-grain model 1157
modular optimization 575
module and network design 946
molecular diffusion 883
molecular engineering 1902
molecular modeling 99
molecular sieve 99, 911
molecular simulation . . . 1753, 2086, 2504
molecular tagging velocimetry 450
molecular thermodynamics 197
monitoring 2183
Monte Carlo simulation 292, 1234
Mp Tuning 1616
MRI 6, 2151
MSPC 1813
MTBE 866
multicomponent crystallization 2435
multicomponent diffusion 2369
multicomponent distillation 1974
multicomponent mixtures . 883, 892, 1177, 1957, 2048
multidimensionality 1735
multieffect distillation 2211
multiobjective framework 2475
multiobjective optimization 1046
multiphase flow 1120
multiphase reactors 389, 2256
multiple steady states 955, 2456
multiplicity 2237
multivariable 1566
multivariate statistics 1989

N

nafion 2076
n-Alkane mixtures 2525
nanofiltration 565
nanoporous carbon 651, 734, 1421
nanoporous transport 911
nanostructured materials 1902
Navier-Stokes equation 1907
neural networks 2426
neutron absorption 1688
neutron diffraction of zeolite 2305
Newtonian radial entrance flow 462
n-hexadecane 843
Nickel-diimine 1234
nitrogen 1449
nitrogen adsorption 2305
noncatalytic gas-solid reaction 1253
noncircular tubes 695

nonequilibrium 2237
nonideal mixtures 883, 892
nonisothermal reactor 380, 2256
nonlinear dynamics 824
nonlinear processes 1825
nonlinear reaction dynamics 588
nonlinear system 980, 2456
non-Newtonian fluids 46, 1138
nuclear waste 552
numerical approximations 2369
numerical modeling 1937
numerical simulation 52, 997

O

observer design 588
operability 2198
operation 1209
operation regimes 509
optical fiber probe 2162
optimal bed layering 790
optimal controllers 1616
optimal estimation 1556
optimal models 1616
optimization 380, 946, 2256
optimum catalyst layer thickness 1034
organic crystals 1348
oriented zeolite membrane 221
oscillation amplitude, frequency 37
oscillatory baffled tube 37
output multiplicity 955
oxidation 2274
oxygen 1449, 1860
oxygen permeation 1521
oxygenate 380

P

packed beds 79, 1084, 1089, 2151
packed-bed reactors 380
packing 79
palladium 1521
palladium membrane 1075
paradigm shift 2
paramagnetic contrast 6
parameter estimation 247
parametric programming 335
parametric uncertainty 1616
Pareto sets 1046
parity relation 1813
partial control 2456
particle coating 1735
particle dynamics 1735
particle technology 407
particles 1947
passivity 1593
PCA 1813, 1825, 1850
Péclet number 1290
penalty methods 575
penetration and permeability 695
performance assessment 281
performance curve 790
permeability 565, 1918
permeation 724, 1096
phase diagrams 1400, 1850, 2435
phase equilibrium . . . 169, 751, 866, 2086
phase stability 1422
phase transition 1662
phenol 1168
photocatalysis 1461
photocatalytic degradation 1034
photocatalytic deposition (PCD) 1075
photocatalytic oxidation 829
photoreactor 1461
pigment 355
pinch point 1218, 2225
pinch technology 2112
pipe flow 1798
pipeline rupture 997
plantwide control 133
platinum 2017
platinum surfaces 1454
plume 1947
polydispersity 751
polyethylene 1149, 1234
polyethylene terephthalate 1046
polyisobutylene 610
polymer blend 229
polymer melt 610
polymer powders 1290
polymer solutions 1650
polymeric membrane 2383
polymers 1286
polynomial matrices 1566
Ponchon-Savarit diagram 1218
population balances 266, 407
pore-size distribution 734, 1421, 1753, 2245
porous media 1902, 2151, 2344
porous membranes 651
positron emission particle tracking . . 1723
precessing vortex core 1317
precipitation 416, 1191, 1241
preheating rate 2518
preparative chromatography . . 1384, 1530
pressure diffusion 883
pressure drop 597, 707, 1084
pressure signal analysis 509
pressure swing adsorption 540
pressure swing permeation 724
process control 427, 428, 588, 1700, 2198, 2456
process data compression 119
process design 335, 1400, 1700, 2435, 2456
process identification 427, 428
process innovation 355, 2499
process monitoring 1556
process noise covariance matrix 292
process operations 1700, 1769
process safety 997
process synthesis 1400, 1769
process systems engineering 1700
product development 1441
product quality 1989
propagation theory 15
protein 857
protein fractionation 1191
protein stabilization 1478
proton exchange membrane fuel cell . 2053
pseudo-ensembles 2086
PSR 2295
Pt gauze 1837
pumping performance 489
pyrolysis 843, 1025

Q

q_L-variation 110
quantitative systems biotechnology . . 2340

R

radial diffusion model 2097
radial turbines 2373
radiation 1461
radical size dependence 843
reaction distribution 1218
reaction equilibrium 2225
reaction kinetics 2518
reaction surface area 1253
reaction system synthesis 389
reactivation 1280
reactive distillation . 866, 923, 1218, 2417
reactive droplet mixing 1735
reactor design 389
reactors 389, 829, 1632, 2256
reboil ratio 1271
recursive on-line wavelet compression 119
recycle interaction 133
reduced sites 2285
reflux 540, 1271
refractive index matching 1106
relaxation 610
renormalization-group theory 2525
residence time distribution . . . 1441, 1688
resin 197
retrofit 2112
reverse micelles 1471
reverse osmosis 946, 1967
Reynolds shear stress 670
riser dynamics 52
robust control 299, 1593
robust M-estimation 1607
robust performance 1616
robust stability 1616
rotating cone 499
rotating flows 257

S

safety 803
saturation 1566

sawdust pyrolysis 1025
scheelite 68
scraped surface heat exchanger 1138
second law 1593
sedimentation 1947
segmentation. 1241
selectivity 389
selective oxidations. 2489
selectivity enhancement 2295
self-assembled monolayers 1275
sensor arrangement 1581
separated flow 450
separation 1201, 1400
SERP 2295
shear 1280
shear rate 1138
shear stress 1368
sheet-forming process 1581
short chain branch distribution 1234
silica catalyst 2285
silica gel 1541
silica-alimina membrane. 92
silicalite membranes 1096
silver cluster 2305
simulation 247, 1694, 866, 1275
simulated moving bed 247, 1384
simulation and transport processes . . 1191
simulation of agglomerate dynamics . . 407
singularity. 321
size distribution 1376
slack auctions 575
slip sphere 2352
slot coating 1907
slug flow. 476, 1300
slurry 647
sol gel. 616
solid oxide electrolyte. 1449
solid mixtures 2175
solids suspension 647
solute-solute interaction 1307
solution crystallization 1348, 2435
solution mapping 2017
solvent effect 1348
solvent vapor recovery 540
sonochemistry. 372, 684
sorbate-sorbate interactions. 1662
sorbent characterization 1888
sorption 2295
spatial distribution 675
spatiotemporal patterns. 1632
spinodal 2076
spiral 1967
spouted bed. 1025
stability 321, 824, 2030
state estimation 292, 980, 1581
statistical mechanics 2504
statistical process control 2183
stirred reactor 2373
stochastic theory 2344
Stokes deformation number 529
stream pricing. 575
structural characterization 2245
structured singular value 309
subspace identification 1974
sulfation 1888
sulfidation. 1157
supercritical carbon dioxide . . . 857, 2065
supercritical fluid 901, 2065
supercritical water. 2274
surface diffusion 1743
surface kinetics. 2017
surfactants 160
suspension processing. 626
suspensions 626, 1106, 2162
swelling 2383
swirling flow 1317
syngas. 1260
system identification. 1607

T

tangent plane distance. 1422
Taylor-Couette flow 2395
terminal velocity. 46
ternary equilibrium 2076
thermal diffusion. 883, 892
thermal unfolding 1478
thermally coupled system 2198, 2211
thermodynamics 416
thermodynamic efficiency. 2475
thermodynamics of chemically
reactive mixtures. 1676
thermophoresis 2352
thin films 769
time-series analysis. 1441
time-series modeling. 281
time-variant surrounding
bulk concentration. 2097
tissue engineering 1286, 1860
titania membrane 1075
titanium dioxide 1034
titanium waste recycling 2499
total reflux 1209, 2225
transient diffusion 2369
transient processes. 803, 2369, 1332
transition. 1106
transport 651
transport limitations 1837
transport model. 2128
trickle flow 597
Tröeger basis adsorption 1530
tubular filter 476
tubular reactor. 1241, 1593
turbulence 1317, 1496, 1798, 2373
two-phase flow 52, 434, 707, 1300,
1332, 2053

U

ultrasound 684, 1650
ultraviolet light 829
uncertainty 335
uniqueness 2237
unsteady flow 1138
utility 2408

V

vapor-liquid equilibrium . 169, 1676, 2525
velocity covariance 2344
virus transport. 1894
viscoelastic fluids 1937, 2106
viscosity 1449
viscous Stokes number 529
visualization 1496
VLE inaccuracies 955
VOC destruction. 829
volume-average theory 1918
volume-averaged concentration. 2097

W

wall effects 1454
wall friction 1084
water 1676
waves, moving and standing 1632
wave occlusion 1300
wavelet-modulation. 427, 428
wavelets. 119, 427, 428, 1607
wax deposition 1059
waxy crude oils. 1059
Weber number 1850
wetted-wall. 707
wetting efficiency 597
wiped film reactor. 1046
wire mesh separator 1131
Wulff construction 1348

X

X-ray diffraction. 24

Y

yield-power-law 1937
Young's modulus 1275
YSZ 1521

Z

zeolite membranes 779, 1201
zeolites 99, 221, 616, 758, 1541,
2504, 2305, 1209
ZSM-5 1201

TITLE INDEX TO VOLUME 46

A

Acid-Neutralizing of Marine Cylinder Lubricants: Measurements and Effects of Dispersants . . . 1471
Adsorption Behavior of Surfactants and Mass Transfer in Single-Drop Extraction . . . 160
Analysis of Single-Stage Nonequilibrium Separation Process Problems . . . 2237
Analytical Solution to an Axial Dispersion Model for the Fixed-Bed Adsorber . . . 1168
Axial Mixing in Modern Packings, Gas, and Liquid Phases: II. Two-Phase Flow . . . 79

B

Bioinformatics and Functional Genomics: Challenges and Opportunities *(Perspective)* . . . 2340
Biological Systems Modeling: Powerful Discipline for Biomedical e-R&D *(Perspective)* . . . 430
Biomaterials: Status, Challenges and Perspectives *(Perspective)* . . . 1286
Book Review: . . . 1900
Boron-Substituted ZSM-5 Membranes: Preparation and Separation Performance . . . 1201
Boundary Effects on a Thermophoretic Sphere in an Arbitrary Direction of a Plane Surface . . . 2352
Bubble Formation in High-Pressure Liquid—Solid Suspensions with Plenum Pressure Fluctuation . . . 2162
Bubble-Column and Airlift Photobioreactors for Algal Culture . . . 1872

C

Calcium Carbonate Precipitation Using New Segmented Flow Tubular Reactor . . . 1241
Capillary Flow in a Noncircular Tube . . . 695
CFD Modeling of Heat Transfer in Turbulent Pipe Flows . . . 1798
Characterization of Batch Mixers Using Numerical Flow Simulations . . . 2140
Characterization of Differential Ebulliometers for Measuring Activity Coeffcients . . . 210
Characterization of Downflowing High Velocity Fluidized Beds . . . 515
Closed Operation of Multivessel Batch Distillation: Experimental Verification . . . 1209
Clouds and Climate: Unravelling a Key Piece of Global Warming *(Perspective)* . . . 226
Coalescence in Polymer Blends during Shearing . . . 229
Coalescence of Deformable Granules in Wet Granulation Processes . . . 529
Colloidal Gas Aphrons (CGA): Dispersion and Structural Features . . . 24
Combinatorial Materials Science: Paradigm Shift in Materials Discovery and Optimization *(Perspective)* . . . 2
Comparing Batch Column Configurations: Parametric Study Involving Multiple Objectives . . . 2475
Comparison of Sorbents and Isotherm Models for NH_3-Gas Separation by Adsorption . . . 1541
Construction and Optimization of Complex Surface-Reaction Mechanisms . . . 2017
Convection-Enhanced Mass Transfer in Aggregated Beads for Gel Chromatography . . . 1927
Corrected Horváth-Kawazoe Equations for Pore-Size Distribution . . . 734
Correction . . . 1421
Correlation of Grinding Rate of Gibbsite with Impact Energy of Balls . . . 1694
Crystal Growth Rates and Dispersion for *D*-Fructose from Aqueous Ethanol . . . 239

D

Deconvolution of Permeance in Supported Nanoporous Membranes . . . 651
Design of a Carousel Process for Cesium Removal Using Crystalline Silicotitanate . . . 552
Design of Complex Wire-Mesh Mist Eliminators . . . 1131
Design Sensor Trajectory for Control: Application to Sheet-Forming Processes . . . 1581
Development of Volume-Average Theory for Deep-Bed Filtration . . . 1918
Direct Simulation Monte Carlo Method for Particle Coagulation and Aggregation . . . 1735
Dissolution Kinetics of Polymer Powders . . . 1290
Double-Slit Model for Partially Wetted Trickle Flow Hydrodynamics . . . 597
Draw Resonance and Kinematic Waves in Viscoelastic Isothermal Spinning . . . 2106
Dynamic and Steady-State Features of a Cooled Countercurrent Flow Reactor . . . 2030
Dynamic Behavior of Freely Rising Buoyant Solid Spheres in Non-Newtonian Liquids . . . 46
Dynamic Data Rectification Using the Expectation Maximization Algorithm . . . 1556

E

Early Warning of Agglomeration in Fluidized Beds by Attractor Comparison . . . 2183
Editorials . . . 2120, 2121, 2122
Effect of Mass Transfer and Catalyst Layer Thickness on Photocatalytic Reaction . . . 1034
Effect of Solute Concentration on Hindered Diffusion in Porous Membranes . . . 1307
Effect of Number of Fractionating Trays on Reactive Distillation Performance . . . 2417
Effective Extraction of Titanium from Rutile by a Low-Temperature Chloride Process . . . 355

Effects of Microstructure on the Compressive Yield Stress 72
Electrodiffusional Wall Shear Rate Analysis in Scraped Surface Heat Exchanger 1138
Engineering Approximations for Activation Energies in Hydrogen Transfer Reactions. 2041
Engineering Design Method for Cavitational Reactors: I. Sonochemical Reactors 372
Engineering Design Methods for Cavitation Reactors: II. Hydrodynamic Cavitation 1641
Enhanced Dissolution Following Extended Milling 666
Entropic and Energetic Selectivity in Air Separation with Microporous Materials 99
Equations of State for the Calculation of Fluid-Phase Equilibria 169
Equilibrium and Diffusion of Methanol and Water in a Nafion 117 Membrane 2076
Establishing Independence of Continuous Process Product Samples 1441
Estimating Monotonic Functions and Their Bounds 2426
Estimation of Transport Parameters of RO Membranes for Seawater Desalination 1967
Ethylene Compressor Monitoring Using Model-Based PCA . . 1825
Evolution of Primary and Aggregate Particle-Size Distributions by Coagulation and Sintering 407
Examination of Stochastic Dispersion Theory by MRI in Aperiodic Porous Media 2344
Experimental Measurements of Benzene Oxidation in Supercritical Water 2274
Experimental Study of Wave Occlusion on Falling Films in a Vertical Pipe 1300
Extraction in Thin Liquid Films Generated by Impinging Streams 769
Extractive Bioconversion in a Four-Phase External-Loop Airlift Bioreactor 1368
Extreme Conditions in Binary Reactive Distillation. 2225

F

Feasible Products for Kinetically Controlled Reactive Distillation of Ternary Mixtures. 923
Filtration of Highly Compactible Filter Cake: Variable Internal Flow Rate 110
Finite Element, Discrete-Fracture Model for Multiphase Flow in Porous Media 1120
Flexibility Analysis and Design of Linear Systems by Parametric Programming 335
Flow Measurements on a Turbulent Fiber Suspension by Laser Doppler Anemometry 1106
Fluid Dynamics in Coal Liquefaction Reactors Using Neutron Absorption Tracer Technique. 1688
Fluidization of Solids with CO_2 at Pressures from Ambient to Supercritical 901
Formation and Aging of Incipient Thin Film Wax-Oil Gels . . 1059

G

Gas Dispersion in Downflowing High Velocity Fluidized Beds 523
Generation of Microparticles Using CO_2 and CO_2-Philic Antisolvents 1850
Global Optimization of Mixed-Integer Nonlinear Problems. . 1769
Glycosaminoglycan Deposition in Engineered Cartilage: Experiments and Mathematical Model. 1860
Gradient Formation in Membrane Unit for Differential Precipitation of Proteins 1191
Granular Flow in a Rotating Cone Partly Submerged in a Fluidized Bed 499
Graphical Methods for Reaction Distribution in a Reactive Distillation Column 1218

H

High-Resolution Adsorption Isotherms of Supercritical Carbon Dioxide on Activated Carbon 2065
Hindered Diffusion of Dextran and Polyetheylene Glycol in Porous Membranes 1149
Hydrodynamics of Slug Flow Applied to Cross-Flow Filtration in Narrow Tubes 476

I

IDEAS Approach to Process Network Synthesis: Application to Multicomponent MEN. 2408
Identification, Evaluation and Development of New Products for Environmental Benefit *(Perspective)* 672
Identification of the State of a Fluidized Bed by Pressure Fluctuations 509
Impact of Confinement on Zeolite Cracking Selectivity via Monte Carlo Integration 2504
Impact of Tube-to-Particle-Diameter Ratio on Pressure Drop in Packed Beds 1084
Improving Dual Composition Control in Continuous Distillation by a Novel Column Design 146
In situ Determination of the Viscosity of Gas Mixtures Containing Trace Quantities of Oxygen. 1449
Influence of Geometry and Angular Velocity on Performance of a Rotating Disk Filter. 257
Influence of Impeller Type on the Flow Structure in a Stirred Reactor 2373
Influence of Preheating Rate on Kinetics of High-Temperature Gas-Solid Reactions 2518
Internal Model Control Design for Transition Control 309
Intraparticle Adsorbate Concentration Profile for Linear Driving Force Model 659
Inverse Method to Obtain Reaction Surface Area During Gas-Solid Reactions 1253

K

Kinetic Mechanism Reduction Based on an Integer Programming Approach 361
Kinetic Model of the Partial Oxidation of Methane to Synthesis Gas Over Ru/TiO_2 Catalyst 1260
Kinetics and Product Distribution of *n*-Hexadecane Pyrolysis . 843
Kinetics for the Partial Oxidation of Methane on a Pt Gauze at Low Conversions 1837
Kinetics of High-Pressure Removal of Hydrogen Sulfide Using Calcium Oxide Powder 1157
Kinetics of the Partial Oxidation of Methane to Formaldehyde on Silica Catalyst 2285

L

Lateral Dispersion in Liquid Flow Through Packed Beds at Pe_m <1,400. 1089
Letters to the Editor. 427, 670, 1897
Ligand Diffusion, Receptor Binding, and Internalization: Zeroth-Order Kinetics. 2330
Linear Driving Force Approximation to a Radial Diffusive Model 2097
Lipase Deactivation at Gas-Liquid Interface and Its Subsequent Reactivation 1280
Local Bubble-Size Distribution in Fluidized Beds 1340
Local Transitions in Flow Phenomena through Packed Beds Identified by MRI 2151
Low-Flow Limit in Slot Coating: Theory and Experiments . . 1907

M

Magnetic Resonance Imaging of the Filtration Process 6
Mapping the Cavitation Intensity in an Ultrasonic Bath Using the Acoustic Emission. 684
Mass Transport in a Novel Two-Fluid Taylor Vortex Extractor . . . 2395
Mass-Transfer Calculation Methods for Transient Diffusion within Particles 2369
Measuring Anisotropic Thermal Conduction in Polyisobutylene Following Step Shear Strains. 610
Microbial Competition: Study of Global Branching Phenomena 321
Microencapsulation of Proteins by Rapid Expansion of Supercritical Solution with a Nonsolvent. 857
Microwave Radiation's Influence on Sorption and Competitive Sorption in Zeolites. 758
Modeling Chromatographic Chiral Separations under Nonlinear Competitive Conditions. 1530
Modeling Constant Voltage Electrophoretic Deposition from a Stirred Suspension. 626
Modeling Crystal Shapes of Organic Materials Grown from Solution 1348
Modeling Fluid Phase Transition Effects on Dynamic Behavior of ESDV 997
Modeling the Hydrodynamics of Multiphase Flow Reactors: Current Status and Challenges *(Perspective)* 1102
Molecular and Macroscopic Modeling of Phase Separation . . 2086
Molecular, Pressure, and Thermal Diffusion in Nonideal Multicomponent Mixtures. 883
Molecular Simulation of Multicomponent Reaction and Phase Equilibria in MTBE Ternary System 866
Molecular Tagging Velocimetry Characterization of Rapid KDP Crystal Growth 450
Molecular Thermodynamics of Asphaltene Precipitation in Reservoir Fluids 197
Monte-Carlo Simulation of Branching Distribution in Ni-Diimine Catalyzed Polyethylene 1234
Motion in a Particle Bed Agitated by a Single Blade 1723
Multicomponent Hydrogen/Hydrocarbon Separation by MFI-Type Zeolite Membranes 1957
Multicomponent Space-Charge Transport Model for Ion-Exchange Membranes. 1177
Multieffect Distillation for Thermally Coupled Configurations. 2211
Multiobjective Optimization of an Industrial Wiped-Film PET Reactor 1046
Multiple Steady States in Distillation: Effect of VL(L)E Inaccuracies 955
Multiscale Modeling of Hard Materials: Challenges and Opportunities for Chemical Engineering *(Perspective)* 878
Multistability and Hysteresis in an Industrial Ammonia Reactor 824
Multivariable Model State Feedback: Computationally Simple, Easy-to-Tune Alternative to MPC 1566

N

Nanostructural Tailoring: Opportunities for Molecular Engineering in Catalysis *(Perspective)* 1902
New Approximate Model for Diffusion and Reaction in a Porous Catalyst 661
New Ways to Make Old Chemicals *(Perspective)* 1492
Newtonian Radial Entrance Flow 462
Nonisothermal Synthesis of Homogeneous and Multiphase Reactor Networks 2256
Nonlinear Inferential Cascade Control of Exothermic Fixed-Bed Reactors 980
Nonlinear Process Control Using Contraction Theory 588
Novel Method for Preparing Palladium Membranes by Photocatalytic Deposition 1075
Novel Route to Submicrometer Tungsten Carbide. 68
Numerical Investigation of Gas-Driven Flow in 2-D Bubble Columns 434
Numerical Modeling of Helical Flow of Viscoplastic Fluids in Eccentric Annuli. 1937
Numerical Simulation of Transient Flow of Two Immiscible Liquids in Pipeline 1332

O

On Defining the Partial Control Problem: Concepts and Examples 2456
On-Line Data Compression and Error Analysis Using Wavelet Technology 119
One-Component Permeation Maximum: Diagnostic Tool for Silicalite-1 Membranes? 1096
Onset of Solutal Marangoni Convection in a Suddenly Desorbing Liquid Layer 15
Optimal Design of Reverse Osmosis Module Networks 946

P

Parameters Affecting Fluid Dispersion in a Continuous Oscillatory Baffled Tube 37
Particle-Size Analysis in Mass Crystallization from Solutions. 1376
Passive Control Design for Distributed Process Systems: Theory and Applications 1593
Patterns of Sedimentation from Surface Currents Generated by Turbulent Plumes 1947
Performance Analysis of Axial-Flow Mixing Impellers. 489
Performance Analysis of Four-Bed H_2 PSA Process Using Layered Beds 790

Performance Assessment of Cascade Control Loops 281
Permeation of Drug and Swelling Agent Through Polymeric Membranes 2383
Phase Equilibria for Chain-Fluid Mixtures Near to and Far from the Critical Region 2525
Phase Stability with Cubic Equations of State: Global Optimization Approach 1422
Phase-Equilibrium Fractionation of Continuous Distributions 751
Predicting Adsorption Equilibrium Using Molecular Simulation 1753
Predicting LLE in Mixed-Solvent Electrolyte Systems by an Electrolyte EOS 2318
Preparation of Oriented A-Type Zeolite Membranes 221
Pressure Drop in Gas Slugs in Vertical Tubes and Flooding Instability 707
Pressure Drop Measurements in a Microchannel 1496
Pressure Swing Adsorption Cycles for Improved Solvent Vapor Enrichment 540
Pressure Swing Permeation: Novel Process for Gas Separation by Membranes 724
Pricing Interprocess Streams Using Slack Auctions 575
Process Control Structure Selection Based on Economics 1998
Process Engineering in the Evolving Chemical Industry *(Perspective)* 2123
Progress in the Thermal Sciences: *AIChE Institute Lecture* . . 1704
Product Transfer Between Plants Using Historical Process Data 1989
Pyrolysis of Sawdust in a Conical Spouted-Bed Reactor with a HZSM-5 Catalyst 1025

Q

Quantifying Deformation in Gel Swelling: Experiments and Simulations 2128

R

Recycling Titanium from Ti-Waste by a Low-Temperature Extraction Process 2499
Representation of High-Dimensional, Molecular Solid-Liquid Phase Diagrams 2435
Research Challenges in Process Systems Engineering *(Perspective)* 1700
Residual Activity of Sorbent Particles with a Long Residence Time in a CFBC 1888
Retrofit of Mass Exchange Networks Using Pinch Technology 2112
Rigorous Modeling of UV Absorption by TiO_2 Films in a Photocatalytic Reactor 1461
Riser Hydrodynamics: Simulation using Kinetic Theory 52
Robust Control of Particulate Processes Using Uncertain Population Balances 266
Robust Design of Countercurrent Adsorption Separation Processes: 5. Nonconstant Selectivity 1384
Robust H_∞ Glucose Control in Diabetes Using a Physiological Model 2537
Robust Steady-State Target Calculation for Model Predictive Control 1007

S

Scenario-Integrated Modeling and Optimization of Dynamic Systems 803
Screening Multiphase Reactors for Nonisothermal Multiple Reactions 389
Selectivity Effects on Series Reactions by Reactant Storage and PSA Operation 2295
Semicontinuous, Middle-Vessel Distillation of Ternary Mixtures 1508
Separation of Hydrogen from a H_2-H_2O-HI Gaseous Mixture Using a Silica Membrane 92
Separation of Light Gas Mixtures Using SAPO-34 Membranes 779
Simple New Algorithm for Distillation Column Design 1271
Simulation of an Inert Membrane Reactor for the Synthesis of Maleic Anhydride 2489
Simulation of Self-Assembled Monolayers under Normal Stress 1275
Simulation of Vortex Core Precession in a Reverse-Flow Cyclone 1317
SMB Enantioseparation: Process Development, Modeling, and Operating Conditions 247
Solids Suspension with Axial-Flow Impellers 647
Sorbate/Sorbent Phase Transition during Adsorption of *p*-Xylene in Silicalite 1662
Spatiotemporal Patterns in Thermokinetic Models of Cross-Flow Reactors 1632
Statistical and Causal Model-Based Approaches to Fault Detection and Isolation 1813
"String-of-Beads" Flow of Liquids on Vertical Wires for Gas Absorption 937
Structural Characterization of Polyetherimide-Based Carbon Molecular Sieve Membranes 2245
Structural Effects on Adsorption of Atmospheric Gases in Mixed Li,Ag-*X*-Zeolite 2305
Supported Zeolite Membrane by Vapor-Phase Regrowth 616
Synthesis and Oxygen-Permeation Properties of Thin YSZ/Pd Composite Membranes 1521
Systematic Estimation of State Noise Statistics for Extended Kalman Filters 292
Systems Approach for Evaluating Dynamics and Plantwide Control of Complex Plants 133

T

Temperature Effect on Transport Performance by Inorganic Nanofiltration Membranes 565
Theoretic Information Approach to Protein Stabilization by Solvent Engineering 1478
Theoretical Model of Thermal Diffusion Factors in Multicomponent Mixtures 892
Thermal Effects in Dynamic Storage of Hydrogen by Adsorption 632
Thermally Coupled Distillation with Reduced Number of Intercolumn Vapor Transfers 2198
Thermodynamic Micellization Model for Asphaltene Precipitation Inhibition 416
Thermodynamically Consistent Modeling of a Liquid-Phase Nonisothermal Packed-Bed Reactor 380

Transient Fluidization and Segregation of Binary Mixtures of Particles 2175
Transport in Nanoporous Carbon Membranes: Experiments and Analysis 911
Tuning and Design of Single-Input, Single-Output Control Systems for Parametric Uncertainty. 1616
Two-Dimensional Heterogeneous Model for a Reticulated-Foam Photocatalytic Reactor. 829
Two-Phase Flow Model of the Cathode of PEM Fuel Cells Using Interdigitated Flow Fields 2053
Two-Step Procedure for Data-Based Modeling for Inferential Control Applications. 1974

U

Ultrasound-Modulated Two-Fluid Atomization of Dilute Polymer Solutions 1650
Unified Approach for Synthesizing Crystallization-Based Separation Processes 1400
Use IAST with MPSD to Predict Binary Adsorption Kinetics on Activated Carbon 1743

V

Validating a Prediction Method of Mean Residence Time Spatial Distributions 675
Vapor-Liquid Equilibrium of Aqueous Solutions of Formaldehyde and Methanol 1676
Virus Adsorption Within Pores in Latex: Assessment of Reversibility Effects 1894

W

Wall Effects of Laminar Hydrogen Flames over Platinum and Inert Surfaces 1454
Wavelet-Based Adaptive Robust M-Estimator for Nonlinear System Identification. 1607